Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-Combined (2 to 12).pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

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Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1236-1. Project Narrative_23March2022.pdf

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To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. FY22 Enhanced Air Quality Monitoring for Communities	66.034	$	$	$ 500,000.00	$	$ 500,000.00
2.						
3.						
4.						
5. Totals		$	$	$ 500,000.00	$	$ 500,000.00

Standard Form 424A (Rev. 7- 97)
Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
	FY22 Enhanced Air Quality Monitoring for Communities				
a. Personnel	$	$	$	$	$
b. Fringe Benefits					
c. Travel	5,000.00				5,000.00
d. Equipment	445,000.00				445,000.00
e. Supplies	10,000.00				10,000.00
f. Contractual					
g. Construction					
h. Other	40,000.00				40,000.00
i. Total Direct Charges (sum of 6a-6h)	500,000.00				$ 500,000.00
j. Indirect Charges					$
k. TOTALS (sum of 6i and 6j)	$ 500,000.00	$	$	$	$ 500,000.00
7. Program Income	$	$	$	$	$

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. FY22 Enhanced Air Quality Monitoring for Communities	$	$	$	$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 450,000.00	$ 100,000.00	$ 200,000.00	$ 150,000.00	$ 0.00
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$ 450,000.00	$ 100,000.00	$ 200,000.00	$ 150,000.00	$ 0.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. FY22 Enhanced Air Quality Monitoring for Communities	$ 25,000.00	$ 25,000.00	$	$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 25,000.00	$ 25,000.00	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 500,000

22. Indirect Charges:

23. Remarks:

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EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: | First Name: Wayne | Middle Name:
Last Name: Nastri | Suffix:
Title: Executive Officer

Complete Address:

Street1: 21865 Copley Dr
Street2:
City: Diamond Bar | State: CA: California
Zip / Postal Code: 91765-4178 | Country: USA: UNITED STATES

Phone Number: 909-396-2100 | **Fax Number:**
E-mail Address: wnastri@aqmd.gov

Payee: *Individual authorized to accept payments.*

Name: Prefix: | First Name: Sujata | Middle Name:
Last Name: Jain | Suffix:
Title: Chief Financial Officer

Complete Address:

Street1: 21865 Copley Dr
Street2:
City: Diamond Bar | State: CA: California
Zip / Postal Code: 91765-4178 | Country: USA: UNITED STATES

Phone Number: 909-396-2804 | **Fax Number:**
E-mail Address: sjain@aqmd.gov

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: | First Name: Mary | Middle Name:
Last Name: Leonard | Suffix:
Title: Financial Analyst

Complete Address:

Street1: 21865 Copley Dr
Street2:
City: Diamond Bar | State: CA: California
Zip / Postal Code: 91765-4178 | Country: USA: UNITED STATES

Phone Number: 909-396-2780 | **Fax Number:**
E-mail Address: mleonard@aqmd.gov

EPA Form 5700-54 (Rev 4-02)

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: | First Name: Payam | Middle Name:

Last Name: Pakbin | Suffix:

Title: Program Supervisor

Complete Address:

Street1: 21865 Copley Dr

Street2:

City: Diamond Bar | State: CA: California

Zip / Postal Code: 91765-4178 | Country: USA: UNITED STATES

Phone Number: 909-396-2122 | **Fax Number:**

E-mail Address: ppakbin@aqmd.gov

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: South Coast Air Quality Management District

Address: 21865 Copley Dr

City: Diamond Bar

State: CA: California Zip Code: 91765

B. DUNS No. 025986159

II. Is the applicant currently receiving EPA Assistance? ☒ Yes ☐ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

None

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)	☒ Yes	☐ No
a. Do the methods of notice accommodate those with impaired vision or hearing?	☒ Yes	☐ No
b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?	☒ Yes	☐ No
c. Does the notice identify a designated civil rights coordinator?	☒ Yes	☐ No
VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))	☐ Yes	☒ No
IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)	☒ Yes	☐ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

Yes. John Olvera, Deputy Executive Officer Administrative and Human Resources: 21865 Copley Drive, Diamond Bar, CA 91765-4178; jolvera@aqmd.gov 909-396-2309

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

Yes. A copy of the South Coast AQMD policy (Administrative Policy #22) is attached to this submission.

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Mary Leonard	Executive Officer	03/25/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

NUMBER 22.0 – HARASSMENT/DISCRIMINATION/RETALIATION

Effective: August 21, 2018

Approved By: Wayne Nastri, Executive Officer

22.1 POLICY STATEMENT:

It is the policy of the South Coast Air Quality Management District ("SCAQMD") to provide its employees a work environment that is free from all forms of unlawful employment discrimination, harassment, and retaliation, and that promotes an atmosphere of mutual respect and professionalism.

SCAQMD will not tolerate in the workplace or in work-related situations: discrimination or harassment based on race, ethnicity, religion, color, national origin, ancestry, physical or mental disability, medical condition, genetic information, marital status, registered domestic partner status, pregnancy, sex (including childbirth, breast feeding, and related medical conditions), age, gender, gender identity or expression, sexual orientation, uniform service membership, veteran status, or any other characteristic protected by state or federal employment discrimination laws. This includes conduct by any SCAQMD employee, supervisor or manager, or any intern or other non-employee, such as contractors, vendors providing services to SCAQMD, and others doing business with SCAQMD. Further, SCAQMD does not tolerate unlawful discrimination or harassment by its employees of non-employees with whom SCAQMD has a business or service relationship. Retaliation against any individual for making a report, or for participating in an investigation under this policy is strictly prohibited.

22.2 TYPES OF PROHIBITED CONDUCT:

By way of illustration only, and not limitation, some examples of conduct prohibited by this policy include:

(1) Verbal Harassment - epithets, derogatory comments, slurs, unwanted comments, inappropriate jokes, unwanted invitations or sexual advances, threats, and negative stereotypes.

(2) Physical Harassment - assault, touching, impeding or blocking movement, or any physical interference with normal work or movement.

(3) Visual Forms of Harassment - derogatory posters, notices, cartoons, drawings, photographs, writings, graffiti, gestures, e-mails, and text messages.

(4) Inappropriate Use of Technology – using the Internet, the e-mail system or telephone and/or voicemail systems, text messages, blogging or any other technological means to transmit, communicate, post or receive: (a) sexually-suggestive, pornographic or sexually explicit pictures, messages or materials or other materials prohibited by this policy; (b) or pictures, messages or other materials that denigrate, threaten, or show hostility or aversion towards an individual or group based on race, national origin, sex, sexual orientation or any other protected characteristic under the law and this policy.

(5) Retaliation by any of the above means for having reported harassment or discrimination, or having assisted another to report harassment or discrimination.

An employee's intentions, such as not meaning to give offense or a belief that conduct was welcomed, will not excuse behavior that is found to violate this policy.

22.2.1 Examples of Sexual Harassment

Sexual harassment includes a broad spectrum of conduct including harassment based on sex, gender, gender transition, gender identity or expression, and sexual orientation. By way of illustration only, and not limitation, some examples of unlawful and prohibited behavior include:

- Unwanted sexual advances;
- Offering an employment benefit (such as a raise, promotion, or career advancement) in exchange for sexual favors, or threatening an employment detriment (such as termination or demotion) for an employee's failure to engage in sexual activity;
- Visual conduct, such as leering, making sexual gestures, and displaying or posting sexually suggestive objects, pictures, cartoons, or posters;
- Verbal sexual advances, propositions, requests, or comments;
- Sending or posting sexually-related messages or videos via email, text, instant messaging, or social media;
- Verbal abuse of a sexual nature, graphic verbal comments about an individual's body, sexually degrading words used to describe an individual, and suggestive or obscene letters, notes, or invitations;
- Physical conduct, such as touching, groping, assault, or blocking movement;

- Physical or verbal abuse concerning an individual's gender, gender transition, gender identity, or gender expression; and

- Verbal abuse concerning a person's characteristics such as pitch of voice, facial hair or the size or shape of a person's body, including remarks that a male is too feminine or a woman is too masculine.

22.2.2 Examples of Harassment Based on Other Protected Characteristics

SCAQMD strictly prohibits harassment concerning race, religion, disability, age, veteran status, or any other protected characteristic. By way of illustration only, and not limitation, such prohibited harassment includes:

- Racial or ethnic slurs, epithets, and any other offensive remarks;

- Inappropriate jokes, whether written, verbal, or electronic;

- Threats, intimidation, and other menacing behavior;

- Inappropriate verbal, graphic, or physical conduct;

- Sending or posting harassing messages or videos via email, text, instant messaging, or social media; and

- Other harassing conduct based on one or more of the protected categories identified in this policy.

If you have any questions about what constitutes harassing behavior, ask a Human Resources Manager, your supervisor, or a manager.

22.3 PROHIBITION AGAINST RETALIATION:

Individuals are protected by law and SCAQMD policy from retaliation for opposing unlawful discriminatory practices, for filing an internal complaint under this policy or for filing a complaint with the state or federal agency charged with enforcing anti-discrimination laws, or for otherwise participating in any proceedings conducted by SCAQMD under this policy and/or by either of such governmental agencies.

SCAQMD is committed to prohibiting retaliation against those who themselves, or whose family members report, oppose, or participate in an investigation of alleged unlawful harassment, discrimination, or other wrongdoing in the workplace. By way of example only, participating in such an investigation includes, but is not limited to:

- Filing a complaint with a federal or state enforcement or administrative agency;

- Participating in or cooperating with a federal or state enforcement agency conducting an investigation of SCAQMD regarding alleged unlawful activity;
- Testifying as a party, witness, or accused regarding alleged unlawful activity;
- Making or filing an internal complaint with SCAQMD regarding alleged unlawful activity;
- Providing notice to SCAQMD regarding alleged unlawful activity; and
- Assisting another employee who is engaged in any of these activities and participating in an investigation.

SCAQMD is also committed to prohibiting retaliation in related circumstances, including but not limited to:

- Qualified employees who request a reasonable accommodation for any known physical or mental disability;
- Employees who request a reasonable accommodation of their religious beliefs and observances; and
- An employee who is a victim of domestic violence, sexual assault, or stalking and requests leave time or changes in the workplace to ensure the employee's safety and well-being.

22.4 REPORTING PROCESS:

Anyone who believes that he/she has been harassed or discriminated against should immediately report such incidents to a supervisor, a manager, a Human Resources Manager, an attorney in the General Counsel's Office, or the Assistant DEO/Administrative and Human Resources.

Any employee who observes or overhears discrimination or harassment by another employee, supervisor, manager, or non-employee should report the incident immediately to the individual(s) listed above.

If a person believes that he or she has been retaliated against in violation of this policy, the person should immediately report the matter to a supervisor, a manager, a Human Resources Manager, an attorney in the General Counsel's Office, or the Assistant DEO/Administrative and Human Resources.

22.5 INVESTIGATING COMPLAINTS:

Incidents or concerns relating to discrimination, harassment, or retaliation, as defined by this policy, should be reported in a timely manner so that appropriate steps to address the situation may be taken. Reports can be made to a supervisor, a manager, a Human Resources Manager, an attorney in the General Counsel's Office, or the Assistant DEO/Administrative and Human

Resources. SCAQMD takes all complaints of unlawful harassment, discrimination, or retaliation seriously and will not penalize an employee or retaliate against an employee in any way for reporting harassment, discrimination, or retaliation complaints in good faith.

The Assistant Deputy Executive Officer/Administrative and Human Resources or the Executive Officer will conduct an investigation by assigning an impartial and qualified person (which may include an outside investigator, when deemed necessary or appropriate) and take steps to ensure the investigation is conducted as promptly as possible under the circumstances. Upon conclusion of such investigation, appropriate corrective action will be taken, where warranted. SCAQMD prohibits employees from hindering internal investigations and the internal complaint procedure. All complaints of unlawful discrimination, harassment, or retaliation that are reported to the individuals listed above will be treated as confidentially as possible, consistent with SCAQMD's need to conduct an adequate investigation.

Findings of conduct that violate this policy will result in appropriate corrective action that could involve, in the case of employees, discipline up to and including termination of employment; or, for non-employees, the termination of the contract or business relationship. Additionally, under California law, employees may be held personally liable for harassing conduct that violates the California Fair Employment and Housing Act.

22.6 RESPONSIBILITIES UNDER THIS POLICY:

Managers and supervisors are responsible for implementing this policy, including: taking necessary steps to prevent or correct unlawful employment discrimination, harassment, and retaliation, as described above; keeping subordinates informed of SCAQMD's policy against discrimination, harassment, and retaliation; and promptly reporting to a manager, a Human Resources Manager, an attorney in the General Counsel's Office, or the Assistant DEO/Administrative and Human Resources any complaints received, or observations of discrimination, harassment, or retaliation as defined in this policy.

All SCAQMD staff are responsible for complying with this policy, and for conducting themselves in a manner that promotes mutual respect and professionalism.

22.7 ALTERNATIVE REMEDIES:

Employees may also file allegations of unlawful employment discrimination or harassment with the U. S. Equal Employment Opportunity Commission or the California Department of Fair Employment and Housing. The addresses and phone numbers of these offices can be found in the Government section of your local phone directory, or on the internet at https://www.eeoc.gov and https://www.dfeh.ca.gov.

APPROVED:

Wayne Nastri
Executive Officer

21 AUG 2018
Date

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/25/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier: California

8. APPLICANT INFORMATION:

* a. Legal Name: South Coast Air Quality Management District

* b. Employer/Taxpayer Identification Number (EIN/TIN): 95-3099419

* c. Organizational DUNS: 0259861590000

d. Address:

* Street1: 21865 Copley Dr
Street2:
* City: Diamond Bar
County/Parish:
* State: CA: California
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 91765-4178

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Payam
Middle Name:
* Last Name: Pakbin
Suffix:

Title: Program Supervisor

Organizational Affiliation:

* Telephone Number: 909-396-2122
Fax Number:

* Email: ppakbin@aqmd.gov

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

D: Special District Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 42 * b. Program/Project: 27-49

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 11/01/2022 * b. End Date: 10/31/2025

18. Estimated Funding ($):

* a. Federal	500,000.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	500,000.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☒ a. This application was made available to the State under the Executive Order 12372 Process for review on 03/25/2022.

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name: Wayne

Middle Name:

* Last Name: Nastri

Suffix:

* Title: Executive Officer

* Telephone Number: 909-396-2100 Fax Number:

* Email: wnastri@aqmd.gov

* Signature of Authorized Representative: Mary Leonard * Date Signed: 03/25/2022

Attachment A – Quality Assurance Statement

It is our goal to implement sufficient quality assurance (QA) activities in this research project to ensure that all data generated and processed shall be scientifically valid, statistically representative, and sufficiently precise and accurate. This goal will be achieved by taking adequate QA steps throughout the entirety of this study – from planning to implementation, data collection, analysis, and report writing – that are commensurate with the degree of certainty/confidence needed to address the objectives outlined in the proposal. To this end, operation of all instruments will undergo strict quality assurance/quality control (QA/QC) according to standard operating procedures (SOPs) already established or under development by South Coast AQMD for the AB 617 program and the pertinent Quality Assurance Project Plan (QAPP)[1].

We have summarized herein the quality assurance steps/actions foreseen for different components of this project.

Xact 625i Multi-Metal Monitor (Cooper Environmental)

XRF calibration check will be performed on the Xact 625i unit, using two Element Standards per energy level every three months, to ensure accuracy of the measurements. The Xact 625i monitor runs continuously and automatically performs a daily upscale tracking test to monitor the stability and performance of the XRF processes using four Element Standards: chromium (Cr), lead (Pb), cadmium (Cd), and niobium (Nb).

Filter blank checks will be performed every time the filter tape roll is changed to ensure that readings are not affected by potential contaminations on the filter. In addition, leak checks and flow checks will be performed every two weeks, while a flow calibration will be performed every three months. The inlet of the monitor will be cleaned at proper intervals, as recommended by the manufacturer. Since all of the abovementioned quality assurance guidelines are based on SOP developed for stationary monitoring application of the Xact 625i instrument (California Air Resources Board CARB SOP #450[2]), during the study period, the results of all these checks will be closely monitored to evaluate the suitability of the frequency of performing these tests. Based on these results, further guidelines may be developed, and the current SOPs will be modified, if necessary.

Time-of-Flight Aerosol Chemical Speciation Monitor (ACSM) (Aerodyne Research Inc.)

Sensitivity of the ACSM will be calibrated quarterly by sampling size-selected, dry ammonium nitrate particles by the ACSM and a condensation particle counter (CPC) and by comparing the mass concentration of the nitrate measured by the ACSM with that predicted based on the concentrations measured by the CPC. Relative ionization efficiency of ammonium and sulfate will also be determined when sampling dry, size-selected ammonium nitrate and ammonium sulfate particles. The flow rate, mass spectrometer's tuning parameters, and heater bias setting of the instrument will be checked quarterly in addition to maintenance of the inlet system (i.e., cleaning of the cyclone and the ACSM critical orifice, leak test of the inlet, measuring flows of the vacuum line used along with the Nafion dryer). Regular checks on the instrument will be carried out remotely on a daily basis during the initial stages of deployment. These checks (e.g., flow rate or inlet pressure to indicate the health of the vacuum system and the inlet, signal from air molecules to indicate health of the mass spectrometer and its tuning parameters, vaporizer temperature and filament current to indicate health of the vaporization and the ionization source) are meant to monitor the instrument operation status and alert staff if in-person maintenance is needed. It is expected that the frequency of these checks will be reduced to weekly

[1] Quality Assurance Project Plan (QAPP) for AB 617 Community Air Monitoring Program: http://www.aqmd.gov/docs/default-source/ab-617-ab-134/camps/qapp-for-ab-617-community-air-monitoring-program-(100620).pdf?sfvrsn=6

[2] Standard Operating Procedure for Continuous Determination of Metals in Ambient Air using an Xact 625i Ambient Metals Monitor (CAMB SOP 450): https://ww2.arb.ca.gov/sites/default/files/2019-04/SOP450%20for%20XACT625I%20XRF.pdf

or biweekly checks once the instrument is stable. Additional guidelines may be developed and adopted in consultation with other long-term operators of ACSMs in the US and Europe.

Scanning Mobility Particle Sizer (SMPS) and Condensation Particle Counter (CPC) (TSI Inc.)

Maintenance of the SMPS/CPC system will follow a quarterly schedule during which aerosol and sheath flow rates will be measured and compared with instrument readings, the recirculating flow path of the sheath flow will be checked for any leaks, and the high-voltage supply calibration will be rechecked. The overall sizing accuracy of the system will be calibrated quarterly by sampling standard polystyrene latex sphere particles in the size range of ~50 nm up to ~700 nm. The inlet setup of the system will also be checked quarterly for any leaks and the cyclone will be cleaned. Biweekly, the water reservoir of the CPC needs to be refilled with distilled water while the drain reservoir needs to be emptied. Maintenance of the CPC and replacement of the ionization source will be done following the guidelines that the manufacturer will provide. Remote monitoring of the status of the SMPS/CPC unit (e.g., flow rates, impactor pressure drop, laser power, water level sensor) will be carried out daily during the initial stages of deployment while the frequency of these checks will be reduced later. Additional checks may be added to this maintenance schedule based on the performance of the instrument and additional guidance from the manufacturer.

Other Monitors:

Operation of all instruments leveraged from the existing South Coast AQMD programs will undergo strict QA/QC according to SOPs already established by South Coast AQMD for the AB 617 program and the pertinent QAPP.

Attachment B – Detailed Budget Table for In-Kind Contributions

Description	Leveraged Funds
Equipment:	
Portable trailer	$40,000
LiCor 830 CO2 monitor	$6,000
T640 (or equivalent) PM2.5 monitor	$30,000
AE 33 (or MA350) Black Carbon monitor	$30,000
Davis Vantage Pro2 weather station	$5,000
Total Equipment	***$111,000***
Supplies:	
Consumables, Tools, Hardware, and other Supplies	$15,000
Total Supplies	***$15,000***
Other:	
Siting and Site Operation (Lease, Power, etc.)	$20,000
Total Other	***$20,000***
TOTAL BUDGET	***$146,000***

Attachment C – Acronyms and Abbreviations

AB 617	Assembly Bill 617
ADEO	Assistant Deputy Executive Officer
ASCENT	Atmospheric SCience and mEasurement NeTwork
BC	Black Carbon
CAMP	Community Air Monitoring Plan
CARB	California Air Resources Board
CERP	Community Emissions Reduction Plan
CPC	Condensation Particle Counter
CPF	Conditional Probability Function
CSC	Community Steering Committee
DEO	Deputy Executive Officer
EJ	Environmental Justice
HAP	Hazardous Air Pollutants
NATA	National Air Toxics Assessment
NPF	New Particle Formation
PM	Particulate Matter
PM2.5	Particulate Matter with an Aerodynamic Diameter Below 2.5 µm
PMF	Positive Matrix Factorization
PNC	Particle Number Concentration
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SCAB	South Coast Air Basin
SMPS	Scanning Mobility Particle Sizer
South Coast AQMD	South Coast Air Quality Management District
SOP	Standard Operating Procedures
TPD	Tons Per Day
ToF-ACSM	Time-of-Flight Aerosol Chemical Speciation Monitor
UCR	University of California, Riverside
U.S. EPA	United States Environmental Protection Agency
WCWLB	Wilmington, Carson, West Long Beach

Payam Pakbin, Ph.D.
Program Supervisor

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Education

Ph.D. (Environmental Engineering) 2011
University of Southern California, Los Angeles, CA
B.S. (Chemical Engineering)
Sharif University of Technology, Tehran, Iran 2006

Positions/Appointments

2018-present: *Program Supervisor, Community Air Monitoring - Advanced Monitoring Technologies* Science & Technology Advancement, South Coast Air Quality Management District (South Coast AQMD), Diamond Bar, CA
2013-2018: *Air Quality Specialist*; *Planning, Rules Development and Area Sources*, South Coast AQMD, Diamond Bar, CA
2011-2013: *Post-doctoral research Associate;* Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, CA

Research and Work Experience

- Investigated highly collaborative research projects as leading or supporting roles in experiment design and set up, data quality assurance and control, progress report preparation and peer-reviewed publication writing
- Supervised a multidisciplinary investigation aimed to study the composition, sources, spatial and seasonal characteristics, and toxicological properties of coarse PM in the Los Angeles Basin
- Taught Environmental Engineering classes and courses at the University of Southern California, Los Angeles, CA
- Lead the preparation of South Coast AQMD's Rule 1180 – Refinery Fenceline and Community Air Monitoring technical guidance document, which is the blueprint for all large petroleum refineries in the Los Angeles Basin to design and implement fenceline air monitoring to collect emission data and to fund air monitoring activities in nearby communities
- Currently responsible for the monitoring activities related to the implementation of Assembly Bill (AB) 617, a State Law which was created to address the disproportionate impacts of air pollution in environmental justice communities

Professional Service

- Affiliated with the American Association for Aerosol Research (AAAR; 2008-2013), Air & Waste Management Association (AWMA; 2012)
- Served as a reviewer for the following scientific journals: Nature, Aerosol Science & Technology, Atmospheric Chemistry and Physics, Atmospheric Environment, Environmental Science & Technology, Atmosphere

Publications

Hasheminassab, S., Sowlat, M.H., **Pakbin, P.**, Katzenstein, A., Low, J.C., & Polidori, A. High Time-Resolution and Time-Integrated Measurements of Particulate Metals and Elements in an Environmental Justice Community within the Los Angeles Basin: Spatio-temporal Trends and Source Apportionment. *Under Internal Review for submission to Atmospheric Chemistry & Physics.*

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Verma, V., **Pakbin, P.**, Cheung, K.L., Cho, A.K., Schauer, J.J, Shafer, M.M, Kleinman, M.T., and Sioutas, C., 2010. Physicochemical and oxidative characteristics of semi-volatile components of quasi-ultrafine particles in an urban atmosphere. Atmospheric Environment, 45 (4), 1025-1033.

Pakbin P., Ning, Z., Shafer M. M., Schauer J. J., and Sioutas C.; "Seasonal and Spatial Coarse Particle Elemental Concentrations in the Los Angeles Area". Aerosol Science and Technology. 45(8): p. 949-U156, 2011.

Pakbin P., Ning, Z., Eiguren-Fernandez A., and Sioutas C.; "Modification of Versatile Aerosol Concentration Enrichment System (VACES) for Conducting Inhalation Exposures to Semi-volatile Particles and Vapors". Journal of Aerosol Science, 2011. 42(9): p. 555-566.

Wang D., Kam W., Cheung K., **Pakbin P.**, Sioutas C.; "A Two-Stage Versatile Aerosol Concentration Enrichment System (VACES) for Very High Concentration of Ultrafine, PM2.5 and Coarse PM". Aerosol Science and Technology journal, 2012. 47:3, 231-238.

Li R., Navab M., **Pakbin P.**, Ning Z., Navab K., Hough G., Yu F., Jen N., Morgan T., Finch C., Fogelman A.M., Araujo J., Sioutas C., Hsiai T.; "Ambient Ultrafine Particles Alter Lipid Metabolism and HDL Anti-Oxidant Capacity in LDLR-null Mice". Accepted for publication in the Journal of Lipid Research, 2012.

Li R., Mittelstein D., **Pakbin P.**, Du Y., Tintu Y., Navab M., Sioutas C., Hsiai T.; "Atmospheric Ultrafine Particles Promote Vascular Calcification via the NF-κB Signaling Pathway". American Journal of Physiology – Cell Physiology, 2012. C-00322-2012R1.

Li R., Navab K., Hough G., **Pakbin P.**, Siout as C., Hsiai T. "Exposure to Atmospheric Ultrafine Particles Promotes the Production of Free Oxidative Fatty Acids in the Small Intestine of Low-Density Lipoprotein Receptor-Null Mice". Submitted to Toxicology Letters, 2012.

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Hasheminassab S., **Pakbin P.**, Schauer J. J., Sioutas C.; "Diurnal and Seasonal Trends in the Apparent Density of Ambient Fine and Coarse Particles in Los Angeles". Submitted to the Atmospheric Environment, 2013.

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Education

Ph.D. (Environmental Sciences) 2005
Rutgers University, Graduate School-New Brunswick, NJ
B.S. (Environmental Sciences)
Graduated Summa Cum Laude at Urbino University, Italy 2000

Positions/Appointments

2021-Present: Director of Monitoring and Analysis; Science & Technology Advancement, South Coast Air Quality Management District (South Coast AQMD), Diamond Bar, CA
2016-2021: *Advanced Monitoring Technologies Manager*; Science & Technology Advancement, South Coast Air Quality Management District (South Coast AQMD), Diamond Bar, CA
2013-2016: *Quality Assurance Manager*; Science & Technology Advancement, South Coast AQMD, Diamond Bar, CA
2009-2013: *Air Quality Specialist*; Science & Technology Advancement, South Coast AQMD, Diamond Bar, CA
2007-2012: *Research Assistant Professor*; Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, CA
2005-2007: *Post-doctoral research Associate;* Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, CA

Research and Work Experience

- Taught Environmental Engineering classes and courses at the University of Southern California, Los Angeles, CA
- Supervised a multidisciplinary investigation aimed to study the composition, sources, spatial and seasonal characteristics, and toxicological properties of coarse PM in the Los Angeles Basin
- Developed and implemented quality assurance control methods, plans, procedures, and quality systems for the South Coast AQMD's Monitoring and Analysis program
- Conduced and supervised ambient methane measurements using a mobile platform during the Aliso Canyon Gas Leak in 2015-2016
- Managed South Coast AQMD's ambient air monitoring network operations, special monitoring programs, and related projects
- Responsible for South Coast AQMD's Air Quality Sensor Performance Evaluation Center (AQ-SPEC), which was created to conduct comprehensive performance tests of commercially available, low-cost air quality sensors
- Responsible for South Coast AQMD's fence-line air monitoring program, which was created to demonstrate the capabilities of optical remote sensing technologies for measuring refinery and other industrial emissions
- Responsible for the monitoring activities related to the implementation of Assembly Bill (AB) 617, a State Law which was created to address the disproportionate impacts of air pollution in environmental justice communities

- Responsible for the implementation of South Coast AQMD's Rule 1180, which requires all large petroleum refineries in the Los Angeles Basin to collect emission data at their fenceline and to fund air monitoring activities in nearby communities

Professional Service

- 2020-present: Member of the Aliso Canyon Disaster Scientific Oversight Committee
- 2019-present: Advisory board member for safecast.org
- 2018-present: Member of the National Association of Clean Air Agencies (NACAA) Air Toxics Committee
- 2017-2019: Member of the Porter Ranch Neighborhood Council Ad-Hoc Committee
- 2016-present: Member of the U.S. EPA's E-Enterprise Advanced Monitoring Project Team 1: Options and Feasibility Analysis for Independent Third Party Evaluation/Certification Program
- 2013-present: Member of the California Air Pollution Control Officers Association (CAPCOA) Air Monitoring working group. CAPCOA Monitoring Committee Co-Chair (2017) and Chair (2018)
- 2013-present: Working-group member for the U.S. EPA's National Air Toxics Trends Stations (NATTS) and Photochemical Assessment Monitoring Station (PAMS) programs
- 2007-2009: Peer Review Panel member for the EPA/STAR Grant Program
- Served as a reviewer for the following scientific journals: Aerosol Science & Technology, Atmospheric Chemistry and Physics, Atmospheric Environment, Environmental Science and Pollution Research, Environmental Science & Technology, Indoor Air, Journal of the Air & Waste Management Association and Science of the Total Environment

Publications (from over 60 research articles; for a more complete list please visit:
https://www.researchgate.net/profile/Andrea_Polidori)

Collier-Oxandale A, Papapostolou V, Feenstra B, Der Boghossian B, **Polidori A**. "Towards the Development of a Sensor Educational Toolkit to Support Community and Citizen Science. Citizen Science: Theory and Practice", under review

Connoly RE, Wang Z, Chen Y, Liu JZ, Collier-Oxandale A, Papapostolou V, **Polidori A**, Zhu Y. (2021) "Long-term Evaluation of a Low-cost Air Sensor Network for Monitoring Indoor and Outdoor Air Quality at the Community Scale" Science of the Total Environment, 807(2):150797

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Professional Preparation

Ph.D., Chemistry (Specialization of Physical/Atmospheric Chemistry) 2001
University of California, Irvine
M.S., Chemistry 1997
University of California, Irvine
B.S., Chemistry and B.S., Biology 1996
University of California, Irvine

Positions/Appointments

2016-present: *Assistant Deputy Executive Officer*, Monitoring & Analysis; Science & Technology Advancement, South Coast Air Quality Management District (South Coast AQMD)

2012-2016: *Atmospheric Measurements Manager*, Monitoring & Analysis; Science & Technology Advancement, South Coast AQMD

2006-2012:*Quality Assurance Manager*, Monitoring & Analysis; Science &Technology Advancement, South Coast AQMD

2006-2006: *Senior Air Quality Chemist,* Monitoring & Analysis; Science & Technology Advancement, South Coast AQMD

2001-2006: *Air Quality Chemist,* Monitoring & Analysis; Science & Technology Advancement, South Coast AQMD

PROFESSIONAL SERVICES

National Air Quality Data Exchange Committee, Member **2019 to Present**
National Association for Clean Air Agencies, Steering Committee Member **2015 to Present**
Primary Quality Assurance Organization Curriculum Development Committee, Member **2013 to 2018**
National Association for Clean Air Agencies, Monitoring Committee Member **2012 to Present**
California Air Pollution Control Officers Association, Monitoring Committee Member **2010 to Present**
California Air Response Planning Alliance, Steering Committee Member **2009 to Present**
Quality Assurance National Working Group, U.S. EPA, Member **2007 to Present**
Photochemical Assessment Monitoring Program Working Group, U.S. EPA, Member **2010 to Present**
National Air Toxics Trends Station Program Working Group, U.S. EPA, Member **2010 to Present**
Salton Sea Science Committee, California Natural Resources, Member **2010 to Present**

PROFESSIONAL/ SOCIETY AFFILIATIONS

Air & Waste Management Association **2006 to Present**
American Chemical Society **1998 to 2001 & 2006 to Present**
UCI Alumni Association, Campuswide Honors Program Chapter, President **2004 to 2019**
American Geophysical Union **1997 to 2001**

PUBLICATIONS

- F. E. Ahangar, P. Pakbin, S. Hasheminassab, S. A. Epstein, X. Li, A. Polidori, J.C. Low, "Long-Term Trends of PM2.5 and its Carbon Content in the South Coast Air Basin: A Focus on the Impact of Wildfires," *Atmospheric Environment*, April 2021.
- W. Mui, B. D. Boghossian, A. C.-O., S. Boddeker, J. C. Low, V. Papapostolou, and A. Polidori, Development of a Performance Evaluation Protocol for Air Sensors Deployed on a Google Street View Car, *Environmental Science & Technology* **2021** *55* (3), 1477-1486.

- S. Hasheminassab, M. H. Sowlat, P. Pakbin, A. Katzenstein, J.C. Low, A. Polidori, High time-resolution and time-integrated measurements of particulate metals and elements in an environmental justice community within the Los Angeles Basin: Spatio-temporal trends and source apportionment, *Atmospheric Environment*: X, Volume 7, 2020, 100089.
- J.C. Low, *Measurements of Ambient Naphthalene and Other Polycyclic Aromatic Hydrocarbons, MATES III, Appendix IV*, South Coast Air Quality Management District, September 2008.
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- J. C. Low, N.Y. Wang, J. Williams and R. J. Cicerone, "Measurements of ambient atmospheric C2H5Cl and other ethyl and methyl halides at coastal California sites and over the Pacific Ocean," *Journ. Geophys. Res., 108, D19, 16, 2003*
- K. Redeker, N.Y. Wang, J. C. Low, A. McMillan, S.C. Tyler and R. J. Cicerone, "Emissions of methyl halides and methane from rice paddies," *Science*, 290, 966-969, 2000.
- L. M. Wingen, J. C. Low, and B. J. Finlayson-Pitts, "Chromatography, absorption, and fluorescence: A new instrumental analysis experiment on the measurement of polycyclic aromatic hydrocarbons in cigarette smoke," *J. Chem. Edu.*, 75, 12, 1599-1603, 1998.

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Professional Preparation

Ph.D. (Environmental Engineering) 2016
University of Southern California, Los Angeles, CA
M.Sc. (Environmental Health Engineering) 2013
University of Southern California, Los Angeles, CA
B.Sc. (Chemical Engineering) 2011
Sharif University of Technology, Tehran, Iran

Positions/Appointments

2017-present: *Air Quality Specialist*, Science & Technology Advancement; South Coast Air Quality Management District (South Coast AQMD)
2018-present: *Science Team Member*, Multi-Angle Imager for Aerosols (MAIA) mission, Jet Propulsion Laboratory

Professional Services

- Grant proposal reviewer, Health Effects Institute, 2021
- Scientific Advisory Committee, Design and Development of an Instrument for Toxic-metal Aerosol Real Time Analysis, California Air Resources Board, 2019-present
- Member of the American Association for Aerosol Research (AAAR); 2013-present
- Member of the American Geosciences Union (AGU); 2016-present
- Reviewer for the following scientific journals: *Atmospheric Environment, Environmental Pollution, Environment International, Science of the Total Environment, Atmospheric Pollution Research, Environmental Monitoring and Assessment, Environmental Science & Pollution Research, Aerosol and Air Quality Research, Atmosphere*

Publications (selected from over 35 peer-reviewed publications – Google Scholar Profile)

Hasheminassab, S., Sowlat, M.H., Pakbin, P., Katzenstein, A., Low, J.C., & Polidori, A. High Time-Resolution and Time-Integrated Measurements of Particulate Metals and Elements in an Environmental Justice Community within the Los Angeles Basin: Spatio-temporal Trends and Source Apportionment. *Atmospheric Environment: X 7 (2020): 100089.*

Jones, R.R., Hoek, G., Fisher, J.A., **Hasheminassab, S.**, Wang, D., Ward, M.H., Sioutas, C., Vermeulen, R. and Silverman, D.T. (2020). Land use regression models for ultrafine particles, fine particles, and black carbon in southern California. *Science of The Total Environment, 699, p.134234.*

Feenstra, B., Papapostolou, V., **Hasheminassab, S.**, Zhang, H., Der Boghossian, B., Cocker, D. & Polidori, A. (2019). Performance Evaluation of twelve low-cost $PM_{2.5}$ sensors at an ambient air Monitoring site. Submitted to *Atmospheric Environment, 216, 116946.*

Berger, K., Malig, B.J., **Hasheminassab, S.**, Pearson, D.L., Sioutas, C., Ostro, B. & Basu, R. (2018). Associations of Source-apportioned Fine Particles with Cause-specific Mortality in California. *Epidemiology, 29(5), 639-648.*

CITY OF CARSON

March 22, 2022

Dear Dr. Polidori,

I write as a member of the Community Steering Committee for the AB 617-selected Wilmington, Carson, West Long Beach (WCWLB) community to support the South Coast AQMD's proposal to the U.S. EPA for a grant to fund the project for "Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA."

I have been working closely with South Coast AQMD's staff for the past three years as part of the AB 617 program to address air quality concerns in our community through development and implementation of community air monitoring and community emission reduction plans. I strongly support this grantapplication with the focus on enhanced air quality monitoring since our community has been heavily burdened by air pollution from a variety of sources and impacted by COVID-19 that caused major backlogs at the ports of Los Angelesand Long Beach, potentially worsening air quality in the area.

I believe this grant will provide additional resources that are needed to enhance the monitoring of ambient PM2.5 and its hazardous components in our community to help identify opportunities for emission reduction. I am committed to participate in the design, implementation, and execution of this project as described in the body of the proposal.

Sincerely,

Stefanie Edmondson

Stefanie Edmondson, AICP
Senior Planner

701 EAST CARSON STREET • P.O. BOX 6234 • CARSON, CALIFORNIA 90749 • (310) 830-7600

Dear Dr. Polidori,

I write as a member of the Community Steering Committee for the AB 617-selected Wilmington, Carson, West Long Beach (WCWLB) community to support the South Coast AQMD's proposal to the U.S. EPA for a grant to fund the project for "Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA."

I have been working closely with South Coast AQMD's staff for the past three years as part of the AB 617 program to address air quality concerns in our community through development and implementation of community air monitoring and community emission reduction plans. I strongly support this grant application with the focus on enhanced air quality monitoring since our community has been heavily burdened by air pollution from a variety of sources and impacted by COVID-19 that caused major backlogs at the ports of Los Angeles and Long Beach, potentially worsening air quality in the area.

I believe this grant will provide additional resources that are needed to enhance the monitoring of ambient PM2.5 and its hazardous components in our community to help identify opportunities for emissions reduction. I am committed to participate in the design, implementation, and execution of this project as described in the body of proposal.

Sincerely,

Erica Blythen

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Assembly
California Legislature

MIKE A. GIPSON
DEMOCRATIC CAUCUS CHAIR
ASSEMBLYMEMBER, SIXTY-FOURTH DISTRICT

COMMITTEES
AGING AND LONG-TERM CARE
BUSINESS AND PROFESSIONS
GOVERNMENTAL ORGANIZATION
INSURANCE
TRANSPORTATION

SELECT COMMITTEES
CHAIR: INFECTIOUS DISEASES IN HIGH RISK DISADVANTAGED COMMUNITIES
COMMUNITY AND LAW ENFORCEMENT RELATIONS AND RESPONSIBILITIES
DOMESTIC VIOLENCE
FOSTER CARE
NON-PROFIT SECTOR
PORTS AND GOODS MOVEMENT
REGIONAL TRANSPORTATION SOLUTIONS

March 18, 2022

Re: LETTER OF SUPPORT FOR ENHANCED MEASUREMENTS OF PM2.5 CHEMICAL COMPOSTION AND SIZE DISTRIBUTION IN WILNINGTON, CA

As the Assemblymember of the 64th Assembly District who represents half a million residents I fully support South Coast AQMD's proposal to the U.S. EPA for a grant to fund the project for "Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA."

As the lead Author for the AB 617 program to address air quality concerns in our community through development and implementation of community air monitoring and community emission reduction plans. I strongly support this grant application with the focus on enhanced air quality monitoring since our community has been heavily burdened by air pollution from a variety of sources and impacted by COVID-19 that caused major backlogs at the ports of Los Angeles and Long Beach, potentially worsening air quality in the area.

I believe this grant will provide additional resources that are needed to enhance the monitoring of ambient PM2.5 and its hazardous components in my District to help identify opportunities for emissions reduction. My staff and I are committed to participate in the design, implementation, and execution of this project as described in the body of proposal.

DISTRICT OFFICES: 879 W. 190TH STREET, SUITE 920 • GARDENA, CA 90248 • (310) 324-6408 • FAX (310) 324-6465
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Assembly
California Legislature

MIKE A. GIPSON
DEMOCRATIC CAUCUS CHAIR
ASSEMBLYMEMBER, SIXTY-FOURTH DISTRICT

COMMITTEES
AGING AND LONG-TERM CARE
BUSINESS AND PROFESSIONS
GOVERNMENTAL ORGANIZATION
INSURANCE
TRANSPORTATION

SELECT COMMITTEES
CHAIR: INFECTIOUS DISEASES IN HIGH RISK DISADVANTAGED COMMUNITIES
COMMUNITY AND LAW ENFORCEMENT RELATIONS AND RESPONSIBILITIES
DOMESTIC VIOLENCE
FOSTER CARE
NON-PROFIT SECTOR
PORTS AND GOODS MOVEMENT
REGIONAL TRANSPORTATION SOLUTIONS

If you have any questions, please don't hesitate to contact me or my District Director, Victor Ibarra at (310) 324-6408.

Sincerely,

Mike A. Gipson
Assemblymember, 64th District
Democratic Caucus Chair

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March 21, 2022

Dr. Andrea Polidori
Director of Monitoring and Analysis
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178

Dear Dr. Polidori:

As a member of the Community Steering Committee for the AB 617-selected Wilmington, Carson, West Long Beach (WCWLB) community, I support the South Coast AQMD's proposal to the U.S. EPA for a grant to fund the project for "Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA." I have been working closely with South Coast AQMD's staff for the past two years as part of the AB 617 program to address air quality concerns in the WCWLB community through development and implementation of community air monitoring and community emission reduction plans.

I strongly support this grant application with the focus on enhanced air quality monitoring since the WCWLB community has been heavily burdened by air pollution from a variety of sources, including but not limited to shipping and port activities, trains, trucks, refineries, and industrial plants. In addition, this community has been impacted by COVID-19 which caused major backlogs at the ports of Los Angeles and Long Beach, likely worsening air quality in the area.

The above high levels of pollution can have a negative impact on the health of area residents. Short-term exposures to PM2.5 have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days (California Air Resources Board, 2022). This is evidenced by recent data from the California Office of Environmental Health Hazard Assessment (OEHHA) for the WCWLB community. OEHHA's CalEnviroScreen 4.0 data for WCWLB census tracts show an average age-adjusted rate of emergency department visits for heart attacks per 10,000 population of 18.57 (in the top 20 percent of communities statewide); and an average age-adjusted rate of emergency department visits for asthma per 10,000 population of 72.19 (in the top 30% of communities statewide).

I believe this grant will provide additional resources that are needed to enhance the monitoring of ambient PM2.5 and its hazardous components in our community to help identify opportunities for emissions reduction. I am committed to participate in the design, implementation, and execution of this project as described in the body of the proposal. Should you have any questions, please contact me directly at (626) 430-9833 or via email rsobero@ph.lacounty.gov.

Sincerely,

Raúl Sobero

Raúl Sobero, Dr.PH. MPH
Health Program Analyst
Toxicology and Environmental Assessment Branch

RS

cc: Charlene Contreras

Manifest for Grant Application # GRANT13580517

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 20179 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16124 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24054 bytes)

3. Form SF424A-V1.0.pdf (size 22686 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22791 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 15902 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37243 bytes)

Attachments Included in Zip File (total 3):

1. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1234-Combined (2 to 12).pdf application/pdf (size 1669627 bytes)

2. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1236-1. Project Narrative_23March2022.pdf application/pdf (size 391784 bytes)

3. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-SCAQMD Admin Policy #22.pdf application/pdf (size 573796 bytes)

Application for the U.S. Environmental Protection Agency solicitation:
"Enhanced Air Quality Monitoring for Communities"

RFA Number: EPA-OAR-OAQPS-22-01

Project Title: Enhanced measurements of PM2.5 chemical composition and size distribution in Wilmington, CA

Applicant Information: South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
DUNS Number: 025986159

Primary Contact: Dr. Payam Pakbin
Program Supervisor
Phone No. (909) 396-2122
E-mail: ppakbin@aqmd.gov

Brief Description of Applicant Organization: South Coast AQMD is the regulatory agency responsible for improving air quality for large areas of Los Angeles, Orange County, Riverside and San Bernardino counties, including the Coachella Valley

Project Partner: University of California, Riverside, (Primary Contact: Dr. Roya Bahreini)

Project Location: Wilmington, California, 90744

Air Pollutant Scope: Particle pollution, aerosol composition, Hazardous Air Pollutants (HAPs)

Budget Summary:

EPA Funding Requested	Total Project Cost
$500,000	$646,000

Project Period: November 1, 2022 – October 31, 2025

Short Project Description: The proposed project aims at enhancing the monitoring of PM2.5 and its chemical components (including several HAPs) and physical properties in Wilmington, California (a community that has been disproportionately impacted by air pollution and the COVID-19 pandemic) using a suite of advanced fast-response instruments. This project will build on an existing partnership with community representatives, and the results of this study will provide new information on major sources of air pollution such as ship emissions, ports activities, and goods movement and their relative contribution to air quality in Wilmington and the surrounding areas.

Section 1 – Project Summary and Approach

A. Overall Project: Ambient particulate matter (PM) is a complex mixture of solid particles and liquid droplets which may be physically and compositionally diverse, depending on location, emission sources, season, and atmospheric conditions. A large body of scientific research has demonstrated the strong association between exposure to ambient PM and a variety of health outcomes. A growing number of studies have also attempted to link adverse health effects with PM characteristics such as particle size, number concentration, and chemical composition. Results from these studies suggest that certain particle size fractions or chemical components may be more toxic than the others. Additionally, some of the chemical constituents of PM are classified as hazardous air pollutants (HAPs) which are known to cause cancer and other serious health impacts (e.g., As, Ni, Pb). Therefore, it is imperative to monitor ambient PM and better understand its physical and chemical properties.

PM composition measurements have been typically carried out by collecting particles on filter substrates over an extended period of time (24 hours to a week) and subsequently analyzing them in the laboratory. The main drawback inherent to this method is that due to the long sample collection time, the measurements have very coarse time resolution, thereby leading to a loss of valuable information on their sub-daily trends. This information is essential to better understand the sources, formation mechanisms, and atmospheric evolution of PM components. Recent technological advancements, however, have resulted in the development of instruments that have built-in analytical capabilities for online analysis of PM samples, enabling them to quantify ambient levels of PM chemical components *in situ* with an hourly or sub-hourly time resolution. High time-resolution monitoring of the physical and chemical properties of PM enables investigating their formation pathways as well as their temporal variations with respect to the time of day and changes in meteorology and/or source emissions. Moreover, these online instruments provide opportunities to detect episodic and/or exceptional air pollution events and short-lived spikes related to localized emission sources. Lastly, source apportionment analysis using statistical multivariate receptor models (e.g., Positive Matrix Factorization, PMF) could greatly benefit from highly time-resolved measurements of physical properties and chemical composition of PM, as these models typically require a relatively large number of data points to produce a reliable output.

The South Coast Air Quality Management District (South Coast AQMD) operates a large network of total PM2.5 mass concentration measurements in the South Coast Air Basin (SCAB or Basin). Additionally, South Coast AQMD measures the chemical composition of PM2.5 at four sites across the Basin using 24-hr time-integrated samplers with 1-in-3 or 1-in-6 day sampling frequency. While these measurements provide valuable insights about the overall composition of PM2.5, they do not represent the characteristics of PM at local community scales, mainly because these monitoring sites are strategically located in areas to capture regional pollution. There are, however, several communities in the SCAB that are disproportionately impacted by local sources of air pollution whose emissions may not be captured by these regional air monitoring sites.

Over the past decades, South Coast AQMD undertook several Environmental Justice (EJ) initiatives and conducted enhanced air monitoring and took a systematic approach to reduce the disproportionate impact of air pollution in disadvantaged communities. More recently, in 2017, the enactment of Community Air Protection Plan or Assembly Bill (AB) 617[1] provided additional opportunities and resources to accelerate the efforts to address air pollution issues in these communities.

[1] https://ww2.arb.ca.gov/capp

Wilmington, CA is within one of the AB 617-selected communities in the SCAB, which is disproportionately impacted by emissions from a wide variety of sources such as several major refineries, trucks traffic, oil fields, two of the largest US ports, and many other industrial facilities. Over the past few years, substantial air monitoring resources have been used in this community as part of the AB 617 program and through the implementation of Community Air Monitoring Plan (CAMP) for the Wilmington, Carson, West Long Beach (WCWLB) community, to better characterize and track the levels of air pollution in this area[2]. South Coast AQMD's Rule 1180 – Refinery Community and Fenceline Air Monitoring[3] has provided additional resources in this community, particularly for monitoring of emissions from refineries. However, the existing monitoring resources in this area are not adequate to fully characterize the PM chemical composition and its physical properties. This information is particularly important to have because results from recent air monitoring studies in this community suggest that the physico-chemical properties of ambient PM in this area may be largely different from elsewhere in the Basin. For instance, a recent study conducted by the South Coast AQMD (i.e., Multiple Air Toxics Exposure Study; MATES[4]) in 2018-2019 revealed that the highest ultrafine particle number concentrations (PNC) across the entire SCAB were measured in this community. The PNC peaks were consistently measured in the middle of the day (regardless of day of the week) during Summer, likely suggesting new particle formation (NPF) via secondary gas-to-particle conversion processes. Confirmation of this hypothesis is important from the regulatory perspective for designing effective air quality control strategies. Study of NPF events and formation of secondary particles requires detailed measurements of PM size distribution and its chemical composition which are currently not available in this area. Another short-term campaign conducted in collaboration with University of California, Riverside (UCR) in this community found elevated levels of particulate nitrate, organics (including polycyclic aromatic hydrocarbons, PAHs), and metals during northerly winds with major (up to 30%) contribution from aqueous-phase secondary formation to organic mass. While these results provided a glimpse of the characteristics of PM in this area, detailed characterization and process-level understanding of ambient PM requires longer-term measurements of the physical and chemical properties of PM with high time-resolution that can capture these characteristics at very short time scales.

Furthermore, recent backlogs of container ships at the ports of Los Angeles and Long Beach have raised major concerns among members of this community due to the potential for increased emissions and their possible environmental and public health impacts in this area. These backlogs stem from the global supply chain disruptions which were mainly caused by the COVID-19 pandemic. A recent report[5] by the California Air Resources Board (CARB) estimated that by November 2021, the overall containership emissions resulted in an increase of 20 tons per day (tpd) of NOx and 0.5 tpd of PM in the SCAB, which are equivalent to the exhaust emissions from almost 100,000 Class 8 diesel trucks. In the meantime, the SCAB experienced some of the worst particulate pollution events in November 2021 and it is not clear to what extent they are attributed to the increased emissions from the ports and related activities. Given that the global supply chain issues are expected to continue well into 2022 and beyond[6], it is timely to address the impact of increased emissions due to the ports backlog on air quality in this community. To

[2] http://www.aqmd.gov/nav/about/initiatives/environmental-justice/ab617-134/ab-617-community-air-monitoring

[3] http://www.aqmd.gov/home/rules-compliance/rules/support-documents/rule-1180-refinery-fenceline-monitoring-plans

[4] http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v

[5] https://ww2.arb.ca.gov/sites/default/files/2022-01/SPBP_Freight_Congestion_Emissions_Jan2022.pdf

[6] https://www.nytimes.com/2022/02/01/business/supply-chain-disruption.html

fully characterize the potential impact of emissions from ships, ports activities, and the associated goods movement, which all are already among the air quality concerns identified by the members of this community as part of the AB 617 program, detailed measurements of PM composition (e.g., metals) and its physical characteristics (e.g., size distribution) are needed but are currently absent in this area. Such dataset, coupled with advanced statistical analyses (see below), would enable discerning the chemical profiles of different sources of concern and quantifying their relative contributions to the overall particulate pollution burden in this area.

We, therefore, propose herein to enhance the existing monitoring resources in the Wilmington community by adding additional instrumentation that can provide the much needed and currently unavailable information about the physical and chemical characteristics of ambient PM2.5. For this purpose, we will equip a portable trailer with advanced, commercially available, and high time-resolution instruments for stationary PM2.5 monitoring (see Table 1 below).

Table 1. List of proposed instruments to be deployed in a portable trailer for stationary monitoring in Wilmington, CA.

Instrument	Pollutant measured	Time resolution	Manufacturer
Xact 625i	PM2.5 metals	15-60 min	Cooper Environmental LLC
Time-of-Flight Aerosol Chemical Speciation Monitor	PM2.5 organics, sulfate, nitrate, ammonium, chloride	10 min	Aerodyne Research Inc.
AE33 or MA-350 Aethalometer	Black carbon	1 min	Magee/Aerosol or Aethlabs Inc.
Scanning Mobility Particle Sizer (SMPS) and Condensation Particle Counter (CPC)	Particle number size distribution	3 min	TSI Inc.
T640 or equivalent	Total PM2.5 mass concentration	1 min	Teledyne API
LiCor 830	Carbon dioxide	10 sec	LI-COR Biosciences

The Time-of-Flight Aerosol Chemical Speciation Monitor (ToF-ACSM) measures the non-refractory components of PM including organics, sulfate, nitrate, ammonia, and chloride. The Xact 625i measures the mass concentrations of a wide range of particulate metals, many of which are known to be air toxics (e.g., arsenic, lead, nickel, etc.). We will configure both Xact 625i and ToF-ACSM for PM2.5 measurements. We will also use a multiwavelength Aethalometer for near real-time black carbon measurements. In addition to the abovementioned instruments that measure PM2.5 chemical components, we will operate a Scanning Mobility Particle Sizer (SMPS) connected to a Condensation Particle Counter (CPC) for size distribution measurements of sub-micrometer particles as an important physical characteristic of ambient PM. Moreover, we will use a Teledyne API T640 (or an equivalent monitor) and a LiCor 830 instruments for total PM2.5 mass and CO2 concentration measurements, respectively. We will also equip the portable trailer with a weather station for continuous measurements of important meteorological parameters (e.g., wind speed, wind direction). While the time resolution of the proposed monitors range between 1 and 60 minutes, we plan to aggregate the

data into hourly averages. We will also report the real-time data on an existing public-facing dashboard that is used for the AB 617 program[7].

As mentioned above, we plan to equip a portable trailer with these instruments. This approach will enable us to move this suite of instruments to other communities after the completion of this study. For this project, we plan to deploy this trailer at a location in Wilmington, within the existing AB 617 community boundary (Figure 1), that is representative of emissions from all major sources in this area. The exact location of the sampling site will be determined after gathering input from the community members through the existing partnership as part of the AB 617 program in this community (see Section 2). A wind rose plot from a weather station in Wilmington area during 2020-2021 (Figure 1) indicates that this community is impacted by potential emissions from industrial/petrochemical sources, ships, ports activities, and the associated goods movement.

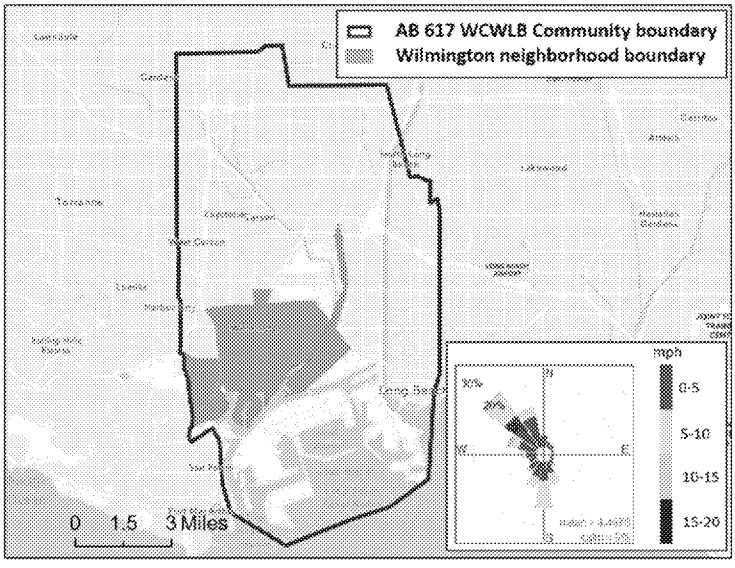

Figure 1. Location of the proposed monitoring area and the AB 617 Wilmington, Carson, West Long Beach (WCWLB) community boundary. Wind rose shows the typical wind pattern in Wilmington during 2020-2021.

We plan to procure the proposed instruments and prepare a portable trailer for deployment during the first year of the project. Starting the second year, we will carry out a year-long continuous air monitoring in Wilmington, CA to fully capture the seasonal, diurnal, and day-of-week patterns of PM2.5 and its physico-chemical properties. During the monitoring phase, we will also develop procedures to automate the preliminary data screening and validation (see section 5). In this phase, we will also collaborate with Professor Roya Bahreini at UCR for the operation, maintenance, and interpretation of the data from the ACSM given her experience and expertise with this type of monitoring equipment. During the third year of the project, we will perform extensive data analysis to investigate the trends, levels, sources, and formation mechanisms of PM2.5 in this area. One of the main objectives of these analyses will be to quantify the relative contributions of primary and secondary sources to PM2.5. To that end, we aim to identify and characterize the NPF events that are likely the main cause of the elevated PNC in this area. We will quantify the seasonality and frequency of NPF events as well as its formation and growth rate. We also plan to perform source apportionment, using the PMF model, and meteorological data analysis (e.g., wind/pollution roses, conditional probability function (CPF)) to identify potential emission source categories and quantify their relative contributions, with a particular focus on sources associated with the recent ports backlog (e.g., ships, cargo handling equipment, truck traffic, etc.). The PMF analysis will be performed on datasets of highly time-resolved mass concentrations of organic and inorganic fractions of PM2.5 as well as number size distributions to apportion both PM mass and number concentrations. PMF results will provide information on the chemical profiles of different primary and secondary sources as well as their temporal trends. Also, PMF model on the organic spectra from ACSM helps differentiate between the contribution of different types of organic aerosols and provides insights

[7] http://xappprod.aqmd.gov/AB617CommunityAirMonitoring/Home/Index

on their sources. Given the large set of chemical species and size distributions measured by the proposed suite of instruments, the PMF model has the potential to identify previously unknown sources of emissions as well. CPF analysis on the PMF-resolved source contributions will elucidate the direction from which each identified source is impacting this community. Our team has extensive knowledge and expertise on these types of analyses, as documented in some recent publications[8,9]

B. Project Significance: The results from this project will significantly enhance our understanding of the sources and formation pathways of PM2.5 in this area which, in turn, will help in developing more targeted and effective emissions reduction strategies (see discussions in Section 2). Information on the relative contributions of different sources to PM2.5, derived from the PMF model, will help guiding competing mitigation strategies. Furthermore, the proposed measurements in this community will provide an opportunity to better understand the potential impact of the recent increased emissions in this area due to the ports backlogs caused by the COVID-19 pandemic. Lastly, it is noteworthy that the proposed measurements in this project will be complementary to the Atmospheric Science and mEasurement NeTwork (ASCENT)[10], a Nationwide monitoring project that is planned to be established in 2022. The ASCENT network, funded by the National Science Foundation, will use a similar set of monitors (including ACSM, Xact 625i, Aethalometer, and SMPS-CPC) at 12 sites across the US, including two South Coast AQMD stations in the SCAB, namely Pico Rivera and Rubidoux. Concurrent high time-resolution measurements of the physico-chemical properties of ambient PM2.5 at these two sites along with the proposed monitoring in Wilmington will provide invaluable information about the characteristics of PM2.5 at three contrasting locations in the Basin. Additionally, given the prevalent air trajectory in the Basin (from west to east), parallel measurements at these three sites will enhance our understanding about the evolution and aging of particles as they are advected from coast to inland. This will be achieved through the proposed collaboration with Professor Roya Bahreini of the UCR, who is the lead co-PI on the ASCENT network in the SCAB.

Section 2 – Community Involvement

A. Community Partnership: In 2017, the California State Legislature adopted AB 617[11] to help address the air pollution impacts in EJ communities which are disproportionally burdened by poor air quality and health impacts from air pollution. In 2018, Wilmington along with the neighboring cities of Carson and West Long Beach were designated as an AB 617 community. South Coast AQMD maintains strong community partnerships within the proposed project area through ongoing AB 617 efforts.

A crucial aspect of AB 617 is the formation of a Community Steering Committee (CSC) in each community to help guide the program implementation. The CSC is comprised of individuals who live or work in the community and represents a broad spectrum of stakeholders, including active residents, community organizations, local governments, universities, public health departments, the Port of LA, and other businesses. This diverse group of stakeholders draw upon their expertise of the community, including intimate knowledge of local emission sources and their individual experiences with air pollution exposure, to help guide the AB 617 process. For example, the CSC designated emissions from refineries, ports, truck traffic, oil drilling and production, railyards, and exposure at sensitive receptors (e.g., schools, childcare centers, homes) as their main air quality concerns to be addressed by the AB 617

[8] https://www.sciencedirect.com/science/article/pii/S2590162120300290
[9] https://acp.copernicus.org/articles/16/4849/2016/
[10] https://rh.gatech.edu/news/651516/12-million-nsf-grant-will-establish-nationwide-atmospheric-measurement-network
[11] https://ww2.arb.ca.gov/capp

program. The comprehensive Community Emissions Reductions Plan (CERP)[12] is a collaborative document that outlines the commitments by the CSC, South Coast AQMD, and CARB to reduce air pollution in this community by addressing their air quality concerns. The data generated from this project on PM2.5 sources and formation mechanisms will further inform the implementation of more effective CERP strategies. For example, this new data can inform CERP commitments to continue rule development of CARB's At-Berth and Commercial Harbor Craft regulations that aim to reduce emissions from ships and harbor craft.

Furthermore, a subset of CSC members are part of the AB 617 Technical Advisory Group (TAG), which will be able to use the results of this study to further inform South Coast AQMD staff on technical matters related to source attribution, air monitoring and other technical analysis needed to fully implement the CERP and the accompanying Community Air Monitoring Plan (CAMP)[13].

Throughout the project, South Coast AQMD will continue to engage and inform the community through various modes of communication already utilized within the AB 617 program. These channels of communication include ongoing quarterly CSC meetings, as well as email notifications, phone calls and other more direct forms of communications. Moreover, South Coast AQMD maintains a Rule 1180 community air Monitoring webpage[14] and a dedicated AB 617 community monitoring webpage[15] for the WCWLB community that provide public access to near real-time air monitoring data, interactive dashboards, and in-depth progress reports. Data and related air monitoring observations will be shared with the community throughout the lifetime of the project through these existing modes of communication.

B. Community Engagement: South Coast AQMD will work closely with the CSC to gather community input on how the data from these measurements could be incorporated into the existing data visualization and access portals in a manner that is easy to understand. Our community partners are committed to continue collaborating with South Coast AQMD in these efforts, as described in the support letters attached to this proposal. From the onset of the project, we will engage and involve community members to discuss and identify the types of questions they are interested in answering using the gathered air quality data in this project. For example, we will be inviting community members to share their personal observations of daily pollution events in their neighborhoods through the existing community meetings and one-on-one discussions, as well as the information reported to the existing air quality complaint reporting system (1-800-CUT-SMOG[16]), whereby community members can share their day-to-day observations and experiences of local pollutions events that may otherwise be missed in the large pool of dataset gathered. The goal for collecting this type of qualitative data is to engage community members, provide an additional lens by which to interpret the large quantitative dataset gathered from this project and to help put into context those results. The South Coast AQMD's team will use this information during the data analysis phase to 1) investigate if the reported observations by the community members coincide with any meaningful changes in the high time-resolution air monitoring data; 2) identify the potential source(s) of emissions by combining air monitoring and wind data; and 3) assess community impact by comparing the levels of measured air pollutants, particularly HAPs, against health-based standards and reporting any exceedances.

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[12] http://www.aqmd.gov/docs/default-source/ab-617-ab-134/steering-committees/wilmington/cerp/final-cerp-wcwlb.pdf?sfvrsn=8

[13] http://www.aqmd.gov/docs/default-source/ab-617-ab-134/camps/wcwlb_camp.pdf?sfvrsn=6

[14] https://xappprod.aqmd.gov/Rule1180CommunityAirMonitoring/

[15] http://xappprod.aqmd.gov/AB617CommunityAirMonitoring/Home/Index

[16] http://www3.aqmd.gov/webappl/complaintsystemonline/NewComplaint.aspx

These community partnerships will enable South Coast AQMD to carry out the project objectives more effectively. Community input and concerns related to specific sources of air pollution in their vicinity will help inform the project design such as the site location for the portable trailer. This project will provide an opportunity for further community education by introducing the CSC and members of the public to the main findings resulting from the analysis of a more comprehensive chemical and physical characterization dataset of PM2.5 which, in turn, will improve our collective understanding of local emission sources and their impacts on local air quality in this EJ community. Furthermore, this proposed project, as part of the broader AB 617 program, will establish a framework for the premise that community members are involved in decisions and cultivate air monitoring information that support and inform those decisions. These efforts will build on the community's interest in the role that community air monitoring can play in mitigating air pollution hazards, and the desire for joint action to create a viable community air monitoring strategy that can work successfully in this community and be piloted in other communities in the future.

Section 3 – Environmental Justice and Underserved Communities

The proposed project for enhanced community monitoring will be conducted in Wilmington, CA within the WCWLB community selected as part of AB 617. The selection of this community was based on several guiding principles including the prioritization of disadvantaged communities that are disproportionately affected by air pollution, utilization of appropriate existing data and tools, consideration and integration of public input, and promotion of health equity. However, as discussed above, despite existing participation in the AB 617 program, additional monitoring resources are needed to address the complexity of air pollution sources present in this area.

The neighborhood of Wilmington is home to several minority groups including people of color and has a large Latino population (86.6%)[17], with a relatively high proportion of children. The U.S. EPA's EJSCREEN demographic results for this community relative to the US show a demographic index in the 91st percentile, people of color population in the 93rd percentile, low-income population in the 79th percentile, linguistically isolated population in the 91st percentile, population with less than high school education in the 95th percentile, and population under 5 years of age in the 72nd percentile[18]. Additionally, CalEnviroScreen 4.0[19] tool, which utilizes public health and socioeconomic factors, indicates that this community is more susceptible to the adverse effects of air pollution compared to statewide averages. For example, the Wilmington community has higher rates of asthma and cardiovascular disease, lower income, and higher than average unemployment.

The residents of this community are in proximity to multiple air pollution sources including five major oil refineries, dozens of oil fields, heavy truck traffic, and many other industrial facilities. Notably, Wilmington neighbors the Ports of Los Angeles and Long Beach, which together comprise the busiest port complex in the nation accounting for nearly 40% of seaborne US imports. Global supply chain issues caused by the COVID-19 pandemic have led to a major backlog of container ships at the ports and upwind of these communities, potentially worsening air quality in the area. Of particular concern is PM2.5, which ambient levels are particularly elevated in this community (95th percentile in the US according to the EJSCREEN environmental indicator for particulate matter) and the composition of which can be highly complex because of contributions from multiple emission sources and multifaceted formation mechanisms. EJSCREEN environmental justice indexes for all variables show percentile values

[17] 2010 United States census

[18] Results were obtained from the US EPA's EJSCREEN tool using a 2-mile ring centered on Wilmington: https://ejscreen.epa.gov/mapper/

[19] https://experience.arcgis.com/experience/11d2f52282a54ceebcac7428e6184203/

above 90 (relative to US), including PM2.5 (94), Ozone (91), National Air Toxics Assessment (NATA) Diesel PM (95), NATA Air Toxics Risk (92), NATA Respiratory Hazard Index (91), and Traffic Proximity and Volume (97). Furthermore, as mentioned in Section 1, a recent study[20] conducted by the South Coast AQMD showed that the highest ultrafine PNCs across the entire South Coast Air Basin were found in this community. The same study also reported that the air toxics cancer risk in this community is higher than 98% of the South Coast AQMD population.

This proposed project will promote environmental justice and address disproportionate health outcomes from pollution and COVID-19 by enabling better speciation of PM2.5 that allows for more accurate source apportionment to support further development of rules and regulations targeting emission reduction from the greatest contributors to air pollution in this overburdened community.

Section 4 – Environmental Results—Outcomes, Outputs and Performance Measures

A. Expected Project Outputs and Outcomes

Outputs

- Deployment of a portable trailer equipped with fast-response instruments for improved characterization of physical properties and chemical components (including HAPs) of ambient PM2.5 in the Wilmington community
- Development of a quality assurance guidelines document for the ToF-ACSM, SPMS-CPC, and other instruments that will be deployed as part of this project
- Development of procedures to automate preliminary data screening and validation
- Time-resolved data on the physical properties (i.e., size distribution) and chemical composition of ambient PM2.5 in the Wilmington community
- Identification of specific sources and source categories that contribute to ambient PM2.5 number and mass concentrations in the Wilmington community
- Near real-time data access portals for communities and other stakeholders
- Promotion of partnership and community involvement through information gathering and outreach materials for dissemination of results (e.g., presentations, infographics, webpages, public meetings)
- Peer-reviewed journal publications
- Progress and final reports

Short-term outcomes

- A portable trailer equipped with fast-response instruments and pertinent quality assurance guidelines for improved characterization of physical properties and chemical components of ambient PM2.5
- Improved community awareness about the levels, composition, and sources of ambient PM2.5 in Wilmington, including PM2.5-bound HAPs
- Increased community access to information and tools that improve understanding of environmental and human health risks

Mid-term outcomes

- Support the development of targeted and effective rules and emission reduction strategies to reduce exposure to ambient PM2.5 and its toxic constituents in Wilmington.

[20] http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v

Long-term outcomes

- Providing the data collected in this project for improved exposure and risk assessment studies and other research projects
- Application of the developed portable trailer, quality assurance guidelines, and data validations procedures developed in this project in other EJ communities within the SCAB as well as by Air Quality Agencies/Districts in the United States
- Reduction of ambient PM2.5 concentrations and its components (including HAPs) in Wilmington through adoption of targeted rules and emission reduction strategies
- The results of this study may also provide the opportunity to apply lessons learnt to the development of effective rules and emission reduction strategies in other coastal communities near major ports

B. Performance Measures and Plan: The progress toward achieving the above-mentioned outputs and outcomes will be tracked with the following performance measures:

- Meeting all proposal objectives
- Execution of the proposed tasks according to the proposed timeline
- Timely submission of the project deliverables (progress and final reports, data, and peer-reviewed publications)
- Appropriate and timely expenditure of allocated funds

C. Timeline and Milestones

Milestones	Project Year 1				Project Year 2				Project Year 3			
(Project Period: 11/1/2022- 10/31/2025)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Purchase air monitoring equipment (11/1/2022 - 7/31/2023)												
Prepare an existing portable trailer for deployment (11/1/2022 - 4/30/2023)												
Prepare the monitoring site and deploy the monitoring trailer (5/1/2023 - 10/31/2023)												
Test equipment prior to deployment (8/1/2023 - 10/31/2023)												
Install monitoring equipment in the portable trailer (8/1/2023 - 10/31/2023)												
Continuous near real-time monitoring (11/1/2023 - 10/31/2024)												
Develop SOPs for equipment (11/1/2023 - 10/31/2024)												
Advanced data analysis and source apportionment modeling (11/1/2024 - 10/31/2025)												
Public outreach, community input gathering, and dissemination of the results (11/1/2022 - 10/31/2025)												

Section 5 – Quality Assurance Statement

The South Coast AQMD management policy requires that sufficient QA activities be conducted to demonstrate that all data collected by and on behalf of the South Coast AQMD is scientifically valid for the purposes to which they are intended. It is our goal to implement adequate quality assurance actions in this research project to ensure that all data generated and processed shall be scientifically valid, statistically representative, and sufficiently precise and accurate. This goal will be achieved by taking adequate quality assurance steps throughout the duration of this study – from planning to implementation, data collection, analysis, and report writing – that are commensurate with the degree of certainty/confidence needed to address the objectives outlined in the proposal. A detailed quality assurance statement has been provided as an attachment to this proposal.

Section 6 – Programmatic Capability and Past Performance

A. Past Performance

1. Design and Development of a Novel Mobile Platform for Time-resolved Air Toxics Measurements: Application for Community scale Monitoring and Source Apportionment (2021 – Present)
2. Engage, Educate, and Empower California Communities on the Use and Applications of "Low-Cost" Air Monitoring Sensors (2016-Present)
3. Application of Next Generation Air Monitoring Methods to Characterize Hazardous Air Pollutant Emissions from Refineries and Assess Potential Impacts to Surrounding communities (2015 – Present)
4. Near-Road Monitoring Program (2014 – Present)
5. National Air Toxics Trends Stations (NATTS) Monitoring Program (2007 – Present)

These ongoing programs have met all requirements and objectives through complete integration into the ambient monitoring activities of the South Coast AQMD.

B. Reporting Requirements: All reporting requirements have been met through the annual network review. Workshops have been conducted to involve and gather input from community and other stakeholders.

C. Staff Expertise: South Coast AQMD is one of the largest local air pollution control agencies in the United States, with 17 million living within its jurisdictional boundaries. South Coast AQMD has made significant progress in improving air quality through a long history of innovative regulations and control measures. Taking advantage of its highly trained and educated staff with stellar track records in advanced measurement and modeling techniques, South Coast AQMD has engaged in numerous large- and small-scale campaigns for improved measurements of gaseous and particulate air pollutants, including HAPs, and employed novel techniques for their source identification and apportionment. The resume of key staff and personnel involved in this project have been attached to this application. South Coast AQMD has a long and successful history of working with local communities and community-based organizations, particularly in EJ communities, with the objective of improving monitoring techniques for air pollutants (including HAPs) and ultimately reducing their emissions and exposure.

Section 7 – Budget

B. Reasonableness of Costs: Following table provides a detailed breakdown of funding requested from EPA for this project.

Equipment: This includes the cost of the proposed equipment to be purchased and used in this project. The other proposed equipment (Attachment B), as well as the portable trailer, have already been or will be purchased by South Coast AQMD. Costs related to siting, monitoring station preparations, and installation of monitoring equipment will also be provided in-kind. **Training**: This training will be provided by the Aerodyne Research Inc. that manufactures the ACSM. This training is needed for South Coast AQMD's instrument specialists to become familiar with operation and maintenance of this equipment. **Supplies**: This includes the consumables, tools, and hardware that is needed for installation, operation, and maintenance of the portable trailer and the monitoring equipment for the project period. **Other**: This is for a subaward for the University of California, Riverside (UCR). As mentioned in section 1, Dr. Roya Bahreini at UCR has extensive knowledge and experience in operation of mass spectrometers and will provide assistance in operation and interpretation of the data from the ACSM in

this study. **Travel**: The requested travel funds support attendance at conferences, workshops, and other platforms to disseminate the results of this study to public. **Personnel/Fringe/Indirect:** Staff costs (provided as in-kind contributions) for the 3-year project are included as follows: Dr. Payam Pakbin (PI) will have the responsibility for the overall design, execution, and technical management of the project. AQS and AQIS II staff involved in the project will be responsible for installation and maintenance of the equipment, technical analysis and reporting of the data, and preparation of outreach materials for dissemination of results. South Coast AQMD senior personnel including Dr. Andrea Polidori (Director of Monitoring and Analysis) and Dr. Jason Low (Assistant Deputy Executive Officer) of the Science and Technology Advancement Division will provide support and oversight to ensure the project's success and will facilitate the involvement of other district staff as needed.

A. Budget Detail

Line Item & Itemized Cost	EPA Funding
Equipment (Quantity):	
Aerodyne Time-of-Flight Aerosol Chemical Speciation Monitor (1)	$230,000
Cooper Environmental Xact (1)	$125,000
TSI Scanning Mobility Particle Sizer (1)	$90,000
Total Equipment	***$445,000***
Training:	
ACSM operation Training	$10,000
Total Trainings	***$10,000***
Supplies:	
Consumables, Tools, Hardware, and other Supplies	$10,000
Total Supplies	***$10,000***
Others	
Subaward for University of California, Riverside	$30,000
Total Others	***$30,000***
Travel:	
Travel to conferences	$5,000
Total Travel	***$5,000***
TOTAL BUDGET	***$500,000***

C. Expenditure of Awarded Funds: Leads will ensure the appropriate distribution and use of funds in a timely manner. A Financial Analyst will provide financial support and reporting.